IceMOS Technology

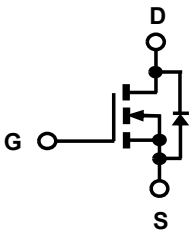
Preliminary
ICEK070GL6LS

ICEK070GL6LS N-Channel Enhancement Mode MOSFET

Product Summary			
I_D	T_A=25°C	36A	Max
$V_{(BR)DSS}$	I_D=250uA	60V	Min
$r_{DS(on)}$	V_{GS}=10V	5.3mΩ	Typ
Q_g	V_{DS}=30V	32nC	Typ

Features

- Very Low $r_{DS(on)}$
- Superior switching performance
- 100% UIS Tested
- Optimized designs for Motor Drivers and DC-DC Converter



DFN3.3x3.3

1-3=Source

4=Gate, 5-8=Drain

RoHS COMPLIANT RoHS (EU) 2015/863

CE

HALOGEN FREE

Maximum ratings [a] at T_j=25°C, unless otherwise specified

Parameter	*Symbol*	*Conditions*	*Value*	*Unit*
Continuous drain current [b]	I_D	T_c=25°C	36	A
		T_c=100°C	30	
Pulsed drain current [b]	$I_{D, pulse}$	T_c=25°C	144	A
Avalanche energy, single pulse	E_{AS}	L=0.5mH, V_{DD}=30V, I_D=19A, R_G=50Ω	90	mJ
Avalanche current, repetitive [b]	I_{AR}	limited by $T_j$max	19	A
Gate source voltage	V_{GS}	Static	±20	V
		AC (f>1Hz)		
Power dissipation	P_{tot}	T_c=25°C	29.7	W
Operating and storage temperature	T_j, T_{stg}		-55 to +150	°C

a Preliminary data sheet - Specifications subject to change.
b limited by Tj_{max}
c when mounted on 1-inch square 2oz copper-clad FR-4

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	
Thermal characteristics						
Thermal resistance, junction-case	R_{thJC}		-	-	4.2	°C/W
Thermal resistance, junction-ambient [c]	R_{thJA}	leaded	-	-	56	
Soldering temperature, wave soldering only allowed at leads	T_{sold}	1.6mm (0.063in.) from case for 10 s	-	-	260	°C
Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	60	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1	2	3	
Zero gate voltage drain current	I_{DSS}	V_{DS}=60V, V_{GS}=0V	-	-	1	μA
Gate source leakage current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Drain-source on-state resistance	$R_{DS\ (on)}$	V_{GS}=10V, I_D=20A	-	5.3	7	mΩ
Gate resistance	R_G	f=1 MHz, open drain	-	1.5	-	Ω
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS}=30V, V_{GS}=0V, f=1 MHz	-	2013	-	pF
Output capacitance	C_{oss}		-	492	-	
Reverse transfer capacitance	C_{rss}		-	34	-	
Turn-on delay time	$t_{d(on)}$	V_{DS}=30V, R_L=1.5Ω, V_{GS}=10V, R_G=6Ω (External)	-	16	-	ns
Rise time	t_r		-	89	-	
Turn-off delay time	$t_{d(off)}$		-	47.5	-	
Fall time	t_f		-	111	-	

Electrical characteristics at T_j=25°C, unless otherwise specified

Parameter	Symbol	Conditions	Values			Unit
			Min	Typ	Max	
Gate charge characteristics						
Gate to source charge	Q_{gs}	V_{DS}=30V, I_D=20A, V_{GS}=0 to 10V	-	4.3	-	nC
Gate to drain charge	Q_{gd}		-	5.2	-	
Gate charge total	Q_g		-	32	-	
Reverse Diode						
Continuous forward current	I_S	V_{GS}=0V	-	-	36	A
Diode forward voltage	V_{SD}	V_{GS}=0V, I_S=1A	-	0.7	-	V
Reverse recovery time	t_{rr}	V_{RR}=30V, I_S=20A, d_{iF}/d_t=100 A/μS	-	38	-	ns
Reverse recovery charge	Q_{rr}		-	41	-	nC
Peak reverse recovery current	I_{rm}		-	1.9	-	A

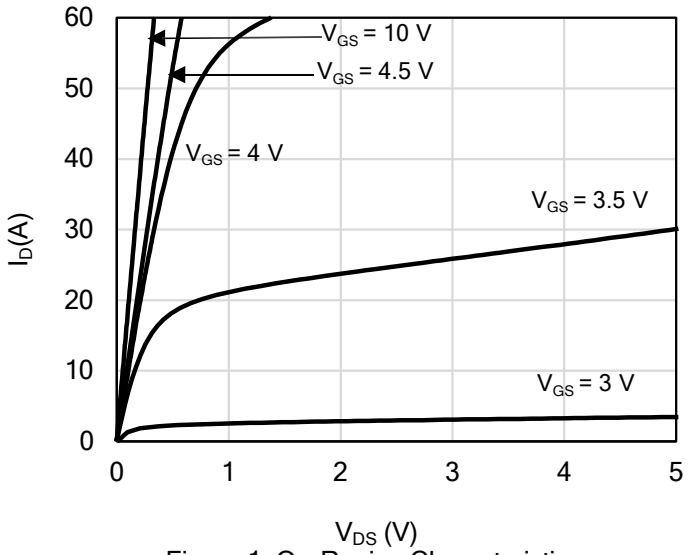


Figure 1: On-Region Characteristics

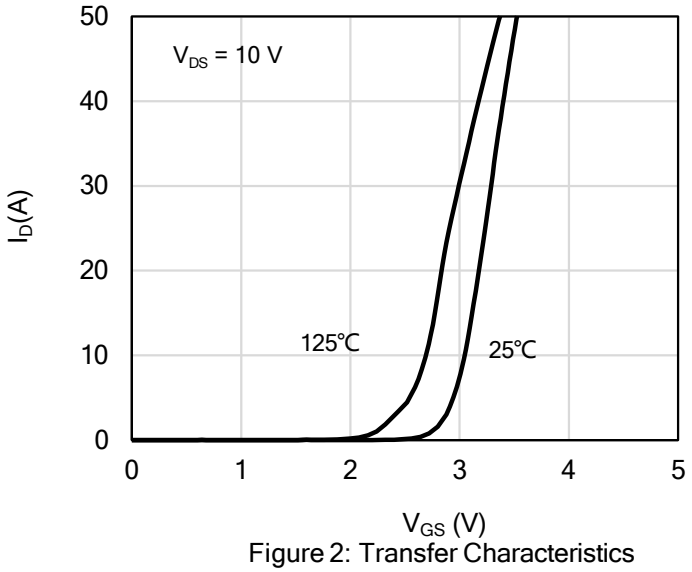


Figure 2: Transfer Characteristics

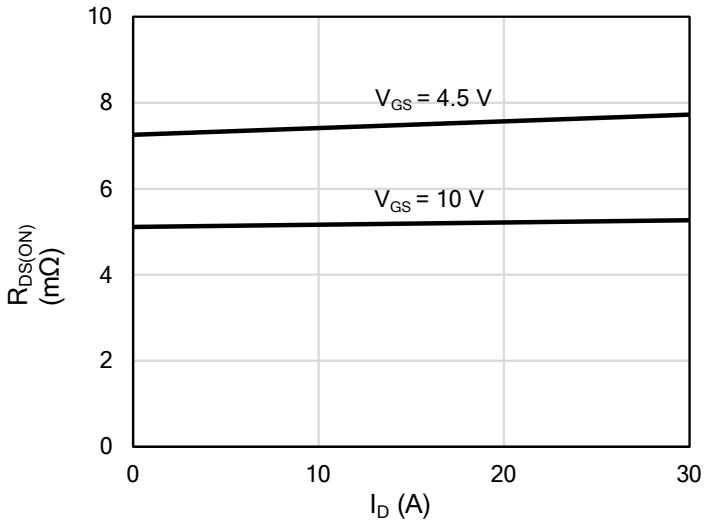


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

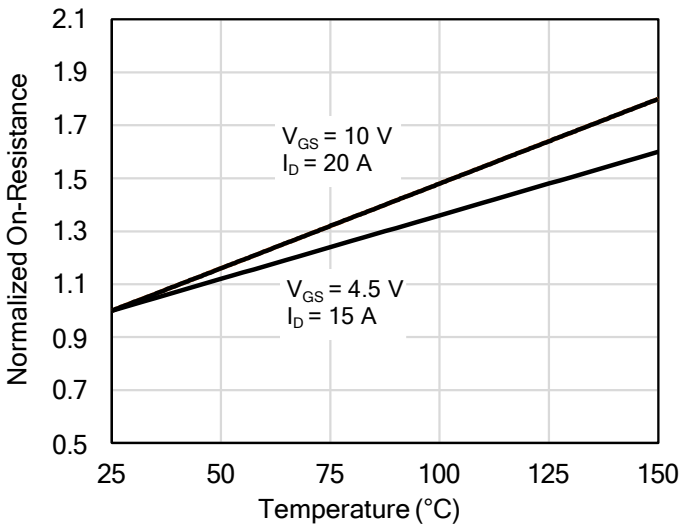


Figure 4: On-Resistance vs. Junction Temperature

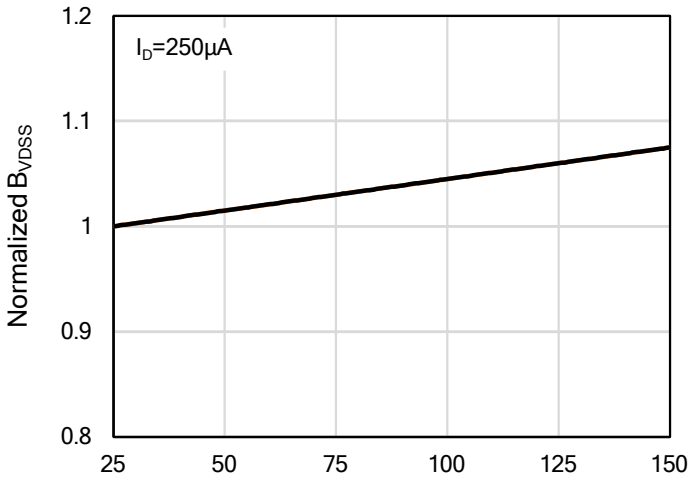


Figure 5: Breakdown Voltage vs. Junction Temperature

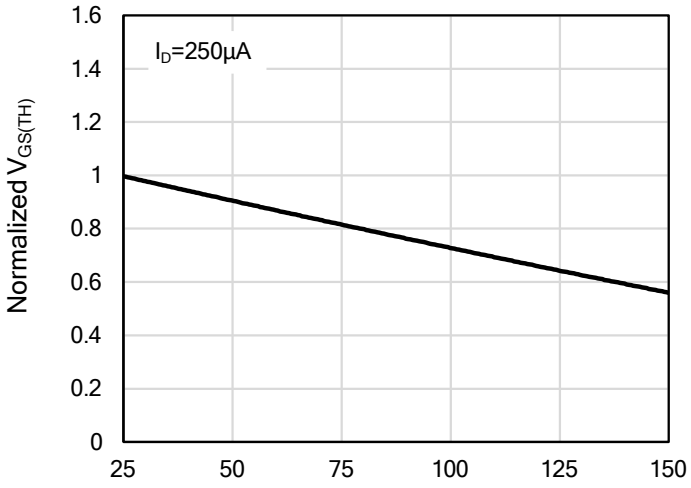


Figure 6: Threshold Voltage vs. Junction Temperature

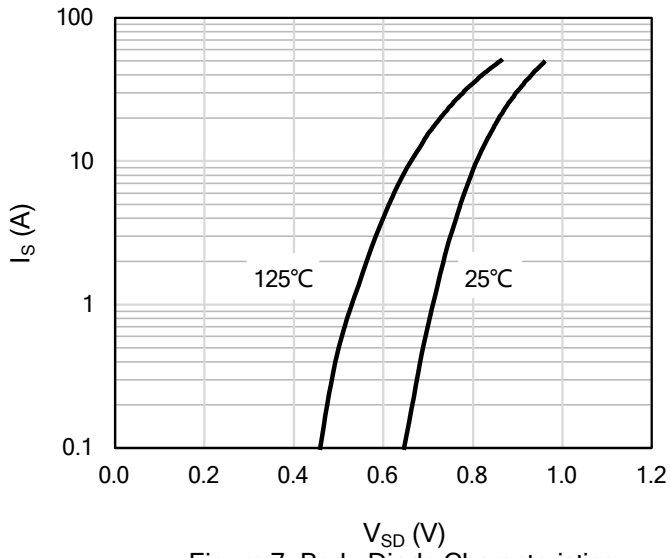


Figure 7: Body-Diode Characteristics

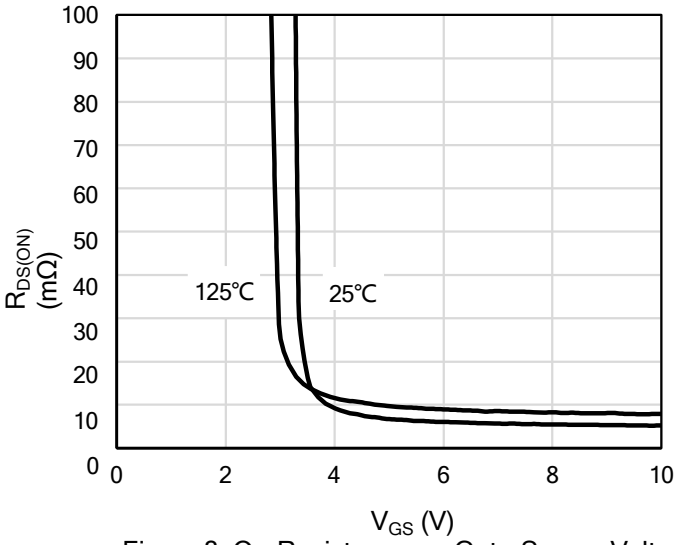


Figure 8: On-Resistance vs. Gate-Source Voltage

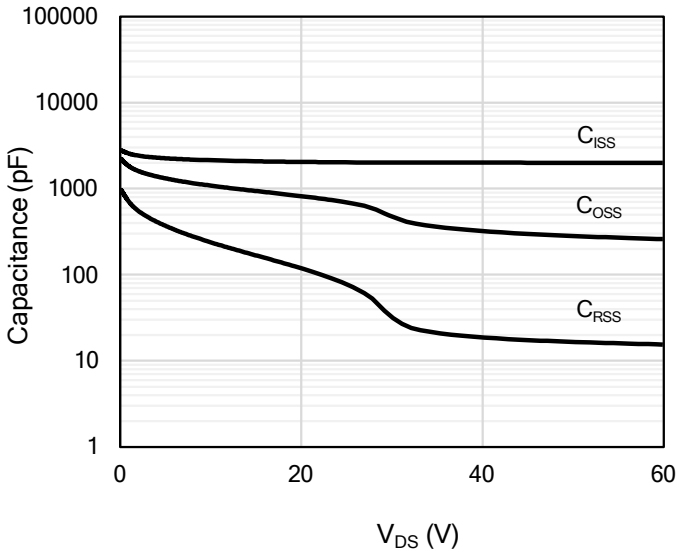


Figure 9: Capacitance Characteristics

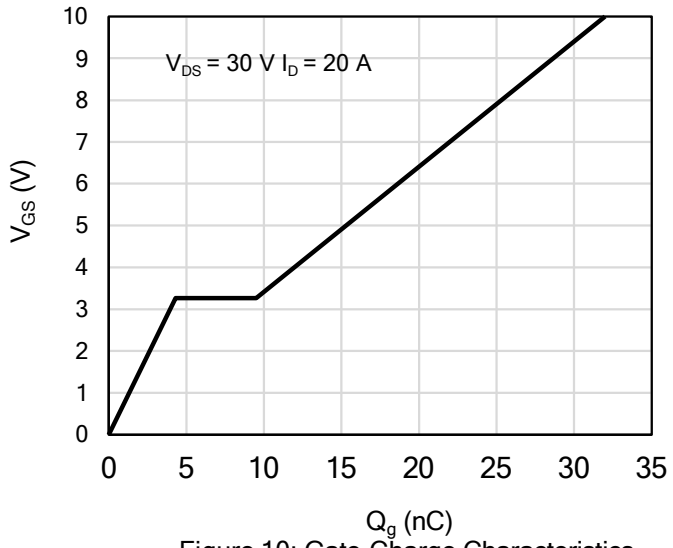


Figure 10: Gate-Charge Characteristics

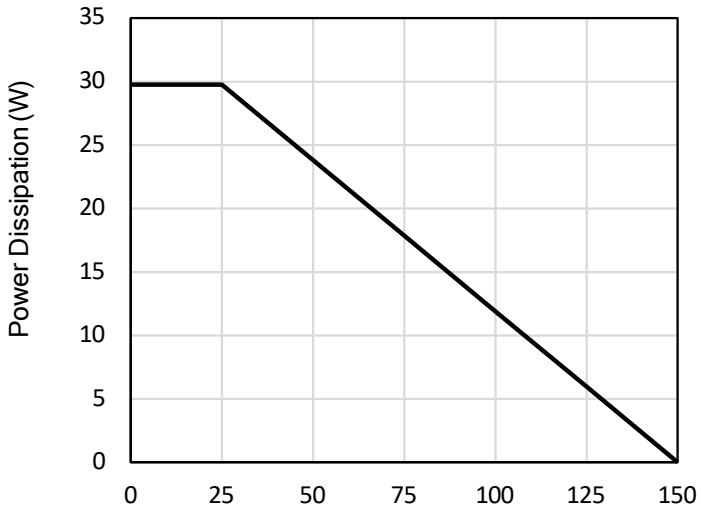


Figure 11: Power De-rating

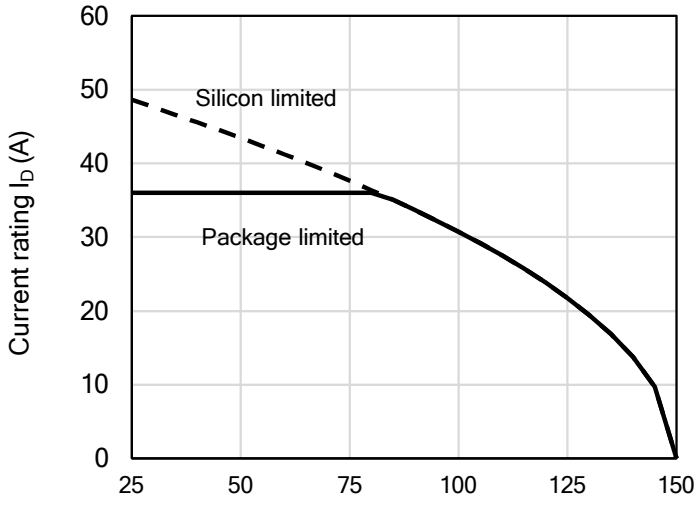


Figure 12: Current De-rating

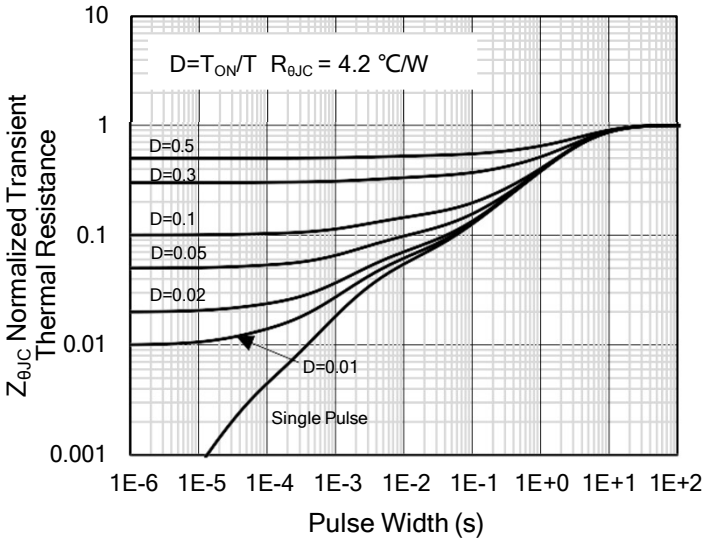


Figure 13: Normalized Maximum Transient Thermal Impedance

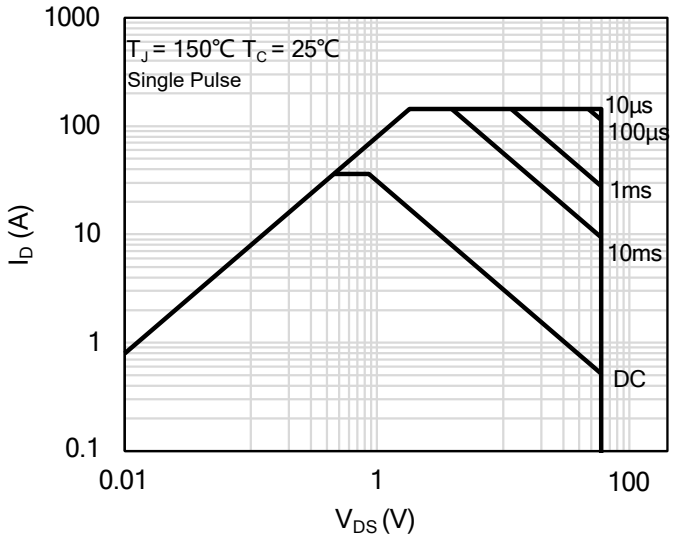
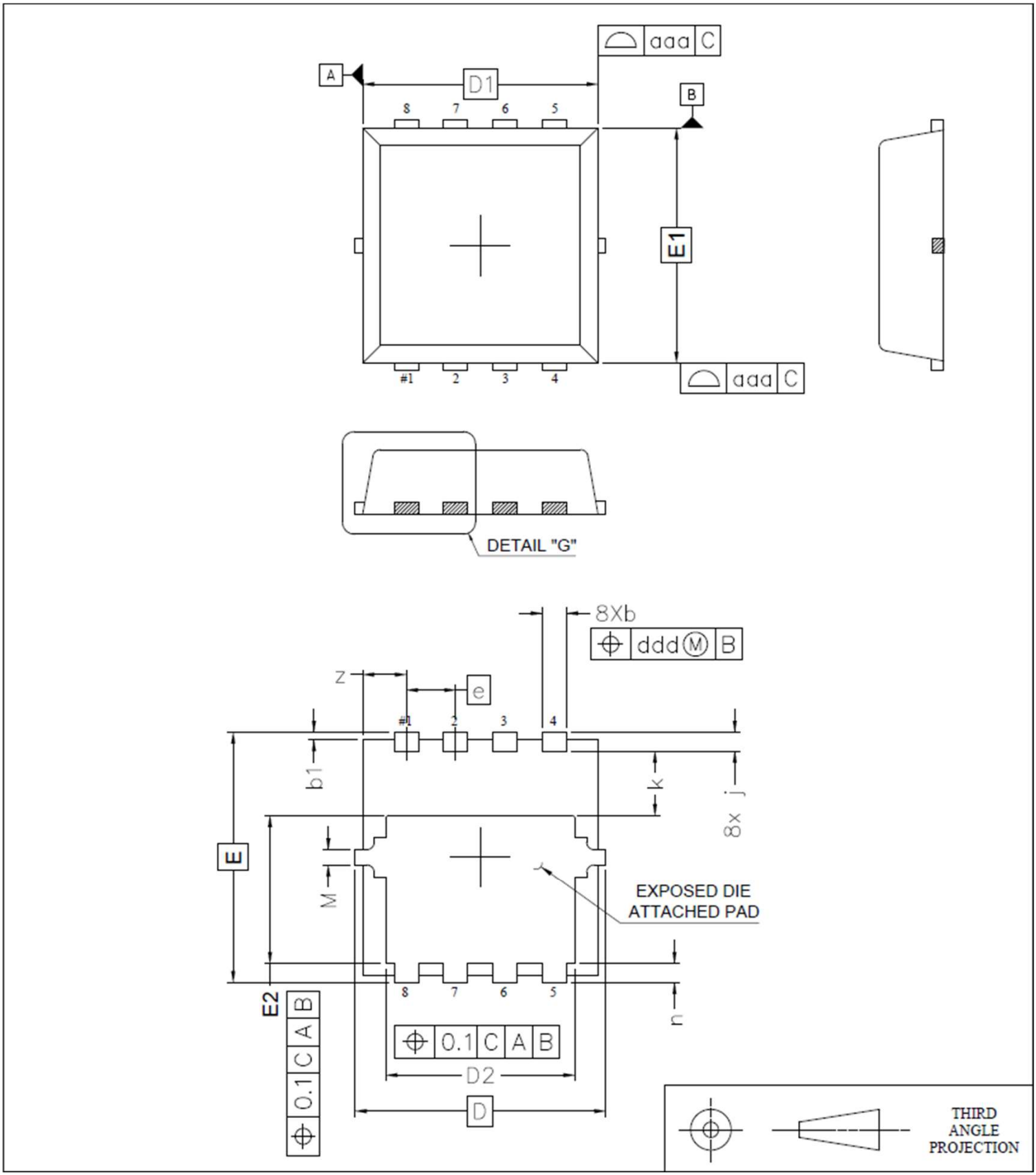


Figure 14: Maximum Forward Biased Safe Operating Area

Package Outline



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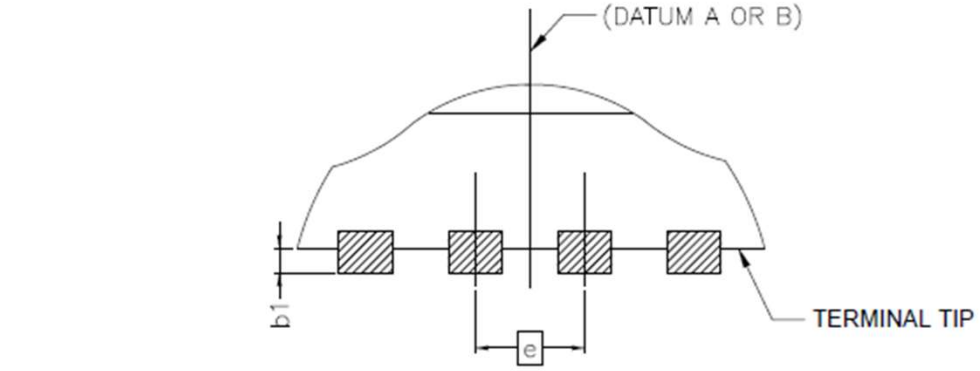
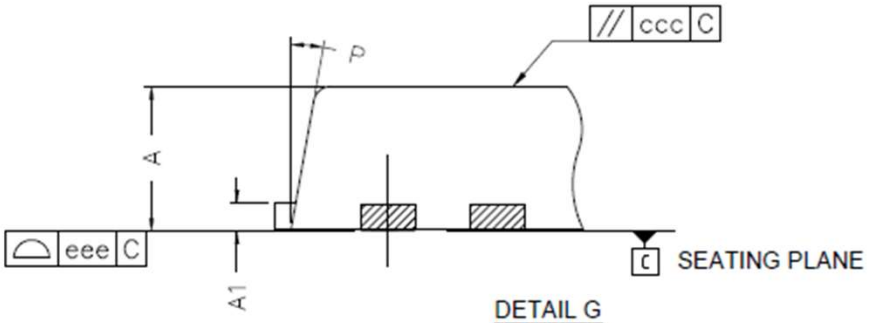


EVEN / ODD TERMINL SIDE
SCALE: 1/1



DETAIL G
SCALE: 1/1

SYMBOL	MIN	MAX	SYMBOL	MIN	MAX	NOTES
A	0.80	0.90	M		0.20	
A1	0.12	0.22	P	9°	11°	1.0 DIMENSIONING & TOLERANCEING CONFIRM TO ASME Y14.5M-1994.
b	0.22	0.42	z		0.58	
b1	0.05	0.15	aaa		0.10	2.0 ALL DIMENSIONS ARE IN MILLIMETERS. ANGLES ARE IN DEGREES.
D	3.30 BSC		ccc		0.10	
D1	3.10 BSC		ddd		0.05	3.0 DIMENSION b APPLIES TO METALLIZED TERMINAL AND IS MEASURED BETWEEN 0.25mm AND 0.30mm FROM TERMINAL TIP. DIMENSION L1 REPRESENTS TERMINAL FULL BACK FROM PACKAGE EDGE UP TO 0.1mm IS ACCEPTABLE.
D2	2.29	2.69	eee		0.05	
E	3.30 BSC					
E1	3.10 BSC					4.0 COPLANARITY APPLIES TO THE EXPOSED HEAT SLUG AS WELL AS THE TERMINAL.
E2	1.85	2.05				
e	0.65 BSC					5.0 RADIUS ON TERMINAL IS OPTIONAL.
j	0.15	0.35				
k	0.75	0.95				6.0 LEAD WIDTH AND LF THICKNESS ARE INCLUDED WITH PLATING THICKNESS
n	0.15	0.35				

Marking Information

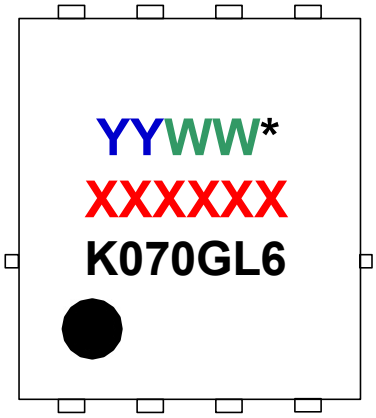
YY = Last two digits of the year

WW = Work week

* = Site ID

XXXXXX = Lot ID

K070GL6 = K070GL6 is a designated device part number



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